CLAIMS

What is claimed is:

1. A gas processing plant comprising:

a refluxed absorber operating at a first pressure, producing a bottoms product stream and receiving a feedstock and an absorber reflux stream;

a distillation column fluidly coupled to the absorber, receiving a distillation column feed stream, producing a distillation column overhead stream, and operating at a second pressure that is at least 100psi lower than the first pressure; and

wherein at least a portion of the bottoms product stream is expanded and provides cooling for at least one of the absorber reflux stream and the distillation column feed stream; and

wherein the distillation column overhead stream is separated into a fluid portion that provides reflux for the distillation column and a gaseous portion that is liquefied and provides the absorber reflux stream.

2. The gas processing plant of claim 1 wherein the distillation column comprises a de-ethanizer column.

3. The gas processing plant of claim 2 wherein the feedstock is at a pressure of between 1000psig and 2000psig.

4. The gas processing plant of claim 3 wherein at least a portion of the feedstock is expanded in a turboexpander.

5. The gas processing plant of claim 3 wherein the bottoms product stream has a pressure and wherein expanding the bottoms product stream reduces the bottoms product stream pressure in a range of 100-250psi.

6. The gas processing plant of claim 3 wherein the expanded bottoms product stream has a temperature between -95°F to -125°F.

7. The gas processing plant of claim 3 wherein the expanded absorber bottoms product stream is fed as the distillation column feed stream into the distillation column at a position that is at least three trays below an upmost tray of the distillation column.

8. The gas processing plant of claim 3 wherein the expanded bottoms product stream further provides cooling for a distillation column overhead stream.

9. The gas processing plant of claim 3 wherein the distillation column produces a distillation column overhead stream that is compressed, cooled, and fed into the absorber as the absorber reflux stream.

10. The gas processing plant of claim 3 wherein the feedstock comprises propane, and wherein the distillation column produces a distillation column product stream that comprises at least 95% of the propane in the feedstock.

11. The gas processing plant of claim 2 wherein the feedstock is at a pressure of between 550psig and 800psig.

12. The gas processing plant of claim 11 wherein the feedstock is fed into the absorber without passing through a turboexpander.

13. The gas processing plant of claim 11 wherein the bottoms product stream has a pressure and wherein expanding the bottoms product stream reduces the bottoms product stream pressure in a range of 100-250psi.

14. The gas processing plant of claim 11 wherein the bottoms product stream has a temperature between -50°F to -70°F.

15. The gas processing plant of claim 11 wherein the expanded bottoms product stream is fed as the distillation column feed stream into the distillation column at a position that is at least three trays below an upmost tray in the distillation column.

16. The gas processing plant of claim 11 wherein at least a portion of the feedstock is fed into a lower section of the distillation column.

17. The gas processing plant of claim 11 further comprising an external refrigeration coupled to the distillation column.

18. The gas processing plant of claim 1 wherein the distillation column comprises a demethanizer.

19. The method of claim 18 wherein the feedstock is at a pressure of between 1000psig and 2000psig.

20. The gas processing plant of claim 18 wherein at least a portion of the feedstock is expanded in a turboexpander.

21. The gas processing plant of claim 18 wherein the bottoms product stream has a pressure and wherein expanding the bottoms product stream reduces the bottoms product stream pressure in a range of 100-250psi.

22. The gas processing plant of claim 18 wherein the expanded bottoms product stream has a temperature between -95°F to -125°F.

23. The gas processing plant of claim 18 wherein the expanded bottoms product stream is fed as the distillation column feed stream into the distillation column.

24. The gas processing plant of claim 18 wherein the distillation column produces a methane rich distillation column overhead stream that is compressed, cooled, and fed into the absorber as the absorber reflux stream.

25. The gas processing plant of claim 18 wherein the distillation column produces a distillation column product stream that comprises no more than 500ppm carbon dioxide.

26. The gas processing plant of claim 18 wherein the feedstock is split into a first portion and a second portion, and wherein an external refrigeration cools at least part of the first portion.

27. The gas processing plant of claim 26 further comprising at least one side reboiler coupled to the distillation column, wherein the at least one side reboiler is fluidly coupled to the demethanizer between a top tray and a position eight trays below the top tray, provides heat duty for stripping CO_2 from a demethanizer product stream, provides reboiling of the distillation column, and further provides cooling of the first portion of the feedstock.

28. The gas processing plant of claim 1, wherein the absorber and the distillation column are configured into a single tower configuration.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/20633

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed.

☒ the description:
pages 1-13 as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the claims:
pages NONE , as originally filed
pages 14-16 , as amended (together with any statement) under Article 19
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the drawings:
pages 1-14 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listi has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages None

☒ the claims, Nos. None

☒ the drawings, sheets/~~fig~~ None

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to i this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/20633

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims	1-28	YES
	Claims	NONE	NO
Inventive Step (IS)	Claims	1-28	YES
	Claims	NONE	NO
Industrial Applicability (IA)	Claims	1-28	YES
	Claims	NONE	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-28 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest a gas processing plant with a refluxed absorber and a distillation column with the overhead stream from the column being used as reflux for the absorber and the column.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 325.137-PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US01/20633	International filing date *(day/month/year)* 27 June 2001 (27.06.2001)	Priority date *(day/month/year)* 11 August 2000 (11.08.2000)
International Patent Classification (IPC) or national classification and IPC IPC(7): F25J 3/00 and US Cl.: 630, 621		
Applicant FLUOR CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☑ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
11 December 2001 (11.12.2001)	25 April 2002 (25.04.2002)
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer William C Doerrler Telephone No. (703) 308-0861

Form PCT/IPEA/409 (cover sheet)(July 1998)

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
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FISH & ASSOCIATES, LLP
1440 N. HARBOR BLVD.
SUITE 706
FULLERTON, CA 92835

PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing *(day/month/year)*	16 MAY 2002
Applicant's or agent's file reference 325.137-PCT	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US01/20633	27 June 2001 (27.06.2001)	11 August 2000 (11.08.2000)

Applicant

FLUOR CORPORATION

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer William C Doerrler
Facsimile No. (703)305-3230	Telephone No. (703) 308-0861

Form PCT/IPEA/416 (July 1992)